Quiz 02 — Selection, Recursion

C# Programming

This is a timed test. You have one hour to complete the test. When you finish the test, email me your `Program.cs` file as a text document, and let me know that you have finished. I will ask you to run your program so that I can see that it compiles and runs.

The Fibonacci series consists of the integers where each subsequent integer is the sum of the two preceding integers, starting with (1, 1). For example, here are the first nine Fibonacci numbers: (1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89). In the Fibonacci series, the last number divided by the next-to-last number is the value of phi (ϕ) that you calculated in your first test. The longer the Fibonacci series, the closer you get to the true value of ϕ. For this series, $\frac{32}{21}$ is 1.619.

Your assignment is to calculate the first 40 Fibonacci numbers *using recursion*, that is, using only the if/else construct. You may NOT use iteration (while, for, or do loops). When you reach the 40th Fibonacci number, do the calculation and print out the value of ϕ..

To write a recursive function, you only have to do two things: (1) determine the end case, and (2) determine the recursive case. If you do not determine the end case, your function will run forever. If you do not determine the recursove case, your function will not return the correct value. Here is an algorithm for you to implement. I created a method with four parameters named *first*, *next*, *place*, and *target*. *Target* sets the termination value. *place* is a counter that counts the number of recursive calls. When *place* is equal to *target*, the end state is reached and the function returns *next / first*. If the end state is NOT reached, the function is called like this: `recursiveFunction(next, first + next, place + 1, target)`. For every call, the first argument is *next*, the second parameter is *first + next*, the third parameter is incremented by 1, and the fourth parameter is unchanged. Here is the expected output. I used the `long` data type to get 90. All you have to get is 40.

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C Sharp Quiz 2
Calculating phi using a recursive method by the Fibonacci series
Calling CalcPhi(1, 1, 0, 90)
The number phi is equal to 1.618033988749895

C:\Users\ccc31\worked-exercises\csharp-quizzes\csharp-Q02\bin\Debug\netcoreapp3.1\csharp-Q02.exe (proces
Press any key to close this window . . .
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